The Foothills Fire Salvage Logging Project: AFSEEE's review of a Boise National Forest Monitoring Report

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Prepared by

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The following review of a Boise National Forest monitoring report is provided by the Association of Forest Service Employees for Environmental Ethics, a nationwide nonprofit organization with over 1,000 Forest Service members.

The June 17, 1995 Boise National Forest report, *Implementation and Effectiveness Monitoring of Best Management Practices and Soil and Water Protection measures Within the Foothills Fire Salvage Logging Area, 1992-1995 by* P.C. Maloney, J.L. Thornton and E. Lesch (hereafter referred to as the Boise report) provided three main conclusions regarding the Foothills Fire project:

1. Salvage logging activities prevented accelerated erosion and stream channel sedimentation when Best Management Practices and soil and water protection measures were consistently applied.

2. Isolated instances of accelerated erosion and sediment delivery occurred only where these protective measures were not implemented.

3. Post-fire watershed conditions actually improved as a result of salvage logging activities. Logging slash increased effective ground cover and decreased soil erosion and sediment delivery to stream systems.

AFSEEE's review has determined that these conclusions are premature and therefore inappropriate. Field observations and data described in the report are insufficient, incomplete, and do not legitimately lead to the conclusions that are made. More specific reasons for our determination are outlined below:

1. The field review conducted by Boise National Forest hydrologists covered only a small portion of the total project area. The Boise report juxtaposes misleading and even contradictory statements that tend to obscure this important fact. For example, on page 2, the Boise report states that over 75 percent of the harvest area was field reviewed by hydrologists and others. The careless reader might infer from this statement that an adequate field review was completed for drawing the conclusions that were made. But the next sentence states that hydrologists field reviewed about 3,100 acres, or 17 percent of the area where concentrated salvage logging occurred. The report does not even mention that when total project area of 53,000 acres is considered, hydrologists actually field reviewed less than six percent of the total project area.

Therefore, the Boise report's conclusion that salvage logging improved watershed condition was based on looking at a small portion of the area affected by salvage logging. Hydrologists did not field review 83 percent of the area where salvage logging activities were concentrated, and they did not field review more than 94 percent of the total project area.

2. The Boise report based its conclusions regarding improved watershed condition primarily on the monitoring of one parameter. The report failed to acknowledge that watershed condition is best indicated by looking at a range of factors. The one parameter considered—sediment delivery to streams from logging activities—is an extremely important indicator of watershed condition, and should be monitored on a regular basis in all watersheds. But it is inappropriate to make sweeping statements that salvage logging activities improved watershed condition, based on monitoring just one indicator of watershed condition over a relatively short period of time.

Regarding sediment delivery, it is critical to look at percent fine sediment in the stream system as a measure of salmonid spawning and rearing habitat quality. A quantitative comparison of percent fine sediment before and after logging would act as a cross-check to field estimates of sediment delivery and would show actual impacts to fish habitat. The report gave no indication that this was done.

In addition, other indicators of watershed condition should be monitored if the goal is to assess the effect of salvage logging and other treatments on overall watershed condition. For example, before-after changes to stream channel morphology such as width-depth ratios, pool-riffle ratios, presence of large wood both instream and in the riparian zone, and water temperature, should all be monitored in the short-term and long-term in both treated and untreated areas. Additionally, what about soil compaction? Did logging operations compact the soils and what effect, if any, did this have on water infiltration rates, water holding capacities, and regeneration of the tree, shrub and herbaceous layers of the forest ecosystem. Each of these considerations are important in assessing overall watershed condition in the short- and long-terms. But the report gives no indication that these factors were monitored.

3. The Boise report did not discuss the important ecological role of standing trees in the forest ecosystem, and failed to analyze the effects of removing a high proportion of these trees. Scientists increasingly emphasize that standing dead trees (particularly large trees) play multiple ecological roles in ensuring the recovery of the watershed and the landscape following wildfire. These standing trees give partial shade, moderate soil temperature and provide favorable micro-climates and shelter for successful establishment of tree seedlings. They also provide habitat for a variety of other species, and assist in any of a number of biological and physical processes (Thomas 1979). Beschta *et al.* (1995) recommended that at least 50 percent of the dead trees in each diameter class should be left standing after salvage logging.

An independent report (Idaho Sporting Congress/Save America's Forests 1995) documented that nearly 700 large trees were removed along Big and Little Rattlesnake Creeks within the Foothills Fire project area. The Boise National Forest's Environmental Assessment for the Foothills Fire project (USDA Forest Service 1992) deemed these trees necessary for protecting stream values. The Boise report failed to analyze the effect of removing standing trees in stream protection zones.

In looking at sediment delivery for an initial three-year period, but not much else, the Boise National Forest cannot assess the substantial benefits that would be expected to accrue to the watershed and the ecosystem by leaving most of the standing large wood. These benefits cannot then be properly balanced against certain benefits that the Boise report claimed are associated with salvage logging.

4. The Boise report failed to assess the relative benefit of the watershed protective measures (such as storm proofing 85 miles of road) compared to leaving slash from salvage logging. The Boise report lumped these two management activities together in its analysis. As such, it is unclear how much the reported reduction in sediment delivery is attributable to the watershed protective measures and how much is attributable to leaving salvage logging slash. The report merely stated that, taken together, watershed protection measures and salvage logging slash reduced sediment delivery.

A reasonable hypothesis is that watershed protective measures, such as storm proofing of roads, were the more important factor in reducing sediment delivery. The Boise report stated that the existing road system is probably the largest major contributor per unit area of sediment to streams. The report also stated that many roads had not been located or constructed according to current standards (see page 27). Therefore, one would expect that storm proofing up to 85 miles of road, as the Boise report indicated was done, would significantly decrease sediment delivery. But, unless the benefit associated with storm proofing roads is separated from the presumed benefit associated with leaving logging slash, there is no way to determine the relative extent to which these measures contributed to the observed reduction in sediment delivery. It could be that storm proofing and other protective measures far outweighed the importance of leaving logging slash (or vice versa). But the monitoring study and report provide no way of making such a determination.

5. Much of the information in the report regarding field observations is incomplete and/or is not useful for drawing valid conclusions. For instance, the Boise report described how small drainage basins were monitored following salvage operations. The only two basins (of the eleven that were sampled) that showed an increase in sediment in 1994 happened to be basins where no salvage logging or watershed protection measures were taken. Can one infer from this that salvage logging improved or stabilized watershed conditions? The answer is clearly no for at least three reasons.

First, the Boise report indicated that the observed difference between drainage basins was "probably related more to the storm pattern than the fact that no logging or BAER [burned area emergency rehabilitation] projects were implemented" in the two basins (page 25). Second, how certain can we be that the observed difference is real without completing a statistical analysis that attaches a level of confidence to the observed difference. The data, as provided, are little more than anecdotal in nature. What is the chance that a different or larger sample might have revealed something else entirely? Third, and perhaps most important, multiple factors are really at work here (salvage vs. no salvage,

storm proofing vs. no storm proofing, plus a multitude of potential site-specific differences, such as highly variable rainfall patterns, slope, aspect, soil conditions, etc.). We are not merely looking at differences associated with salvage logging versus no salvage logging.

6. The Boise report did not adequately support its claim of a high compliance rate in implementing the project as planned. A compliance rate of 95 percent was reported (p. 15), yet virtually no data, methodology or analysis is presented to support that figure. And the admission of minor noncompliance is neither defined nor quantified. This stands in stark contrast to the documentation of more than 2,000 violations found in Forest Service files (as reported by Idaho Sporting Congress/Save America's Forests 1995). The Boise report makes no attempt to reconcile or even acknowledge the substantial difference between its claims of compliance and that of the earlier independent report.

Other sweeping statements about project compliance are also given without substantiating evidence. For instance, the Boise report states that "Sale administrators were quick to remedy or mitigate the protection measures in situations of non-implementation or noncompliance" (p. 17). Nothing is presented to refute the assertion of an earlier independent report (Idaho Sporting Congress/Save America's Forests 1995) that six illegal landings along Little Rattlesnake Creek were not repaired and revegetated as of November 1994, and that contract files were closed prior to satisfactory completion of all requirements. The earlier report also indicated that at least three months elapsed before the Forest Service even acknowledged the need for mitigation of illegal landings.Then, seven months after the Idaho Department of Fish and Game (IDFG) notified the Forest Service of the illegal landings, an on-site visit by IDFG and the U.S. Fish and Wildlife Service found that mitigation measures were still not completed and that two of the landings were still contributing sediment to the creek. Additionally, no evidence is provided in the Boise report to refute or explain earlier claims that none of the sixty-seven constructed landings surveyed were re-vegetated even though this is specifically required by state rules within one year after logging activities cease.

A time-lapse analysis of activities and mitigation measures would likely present a clearer picture of actual project compliance. Such an analysis would compare violations of contract provisions and EA prescriptions with the date of actual mitigation or remedy, the type of mitigation activity taken, and its effectiveness. We found little or nothing of the sort to support the sweeping claim of 95 percent compliance.

7. The Boise report and other Boise National Forest documents provided contradictory statements about monitoring results, especially concerning erosion and sediment delivery. For example, the Boise report states on p. 3 that "Monitoring showed no adverse effects" and on p. 8 that "soil and water resources were protected." These statements are contradicted by statements elsewhere in the report. On p. 16, we are told that a half mile of road exhibited accelerated erosion. Then, on p. 18, we are told that sediment from four illegal

landings along Little Rattlesnake Creek entered the stream. The report's stated conclusion that this was a "small amount of the potential volume" (whatever that means) is not supported by any data, including the amount of sediment delivered to the stream. How can such impacts be judged as non-detrimental without a thorough analysis of the impacts? No such analysis, data or measurements were provided.

Additionally, given the important thesis of the Boise report that salvage logging substantially reduced sediment delivery, we wonder why this thesis is not reflected in environmental documents prepared for more recent salvage projects on the Boise National Forest. The Foothills EA (USDA Forest Service 1992) claimed that logging slash alone would "[r]educe erosion by up to 70 percent over approximately 18,000 acres." However, this unsupported claim does not appear in the Environmental Impact Statement (EIS) for the Boise River Wildfire Recovery Project, which was modeled after the Foothills project. Instead, the Boise River EIS (USDA Forest Service 1995) claimed at best only "slight" benefits from logging slash.

8. **The Boise report is thoroughly biased in the way scientific information is presented.** For example, on page 1, the report states, "The scientific literature suggests that proper fire salvage logging and road drainage improvements can have several benefits which can result in improved watershed condition." While this may be true in certain instances, the statement should have cited the relevant supporting literature. The statement ignored a significant body of literature that tell us that caution must be exercised in conducting logging operations after a major fire event. Post-fire landscapes are especially vulnerable to disturbance, so that salvage logging may cause significantly more harm than good (see, for example, Beschta et al. 1995). The statement also ignored recent scientific research indicating that rate of fire spread and burn intensity are positively correlated with the proportion of a watershed that has been logged (see, for example, Huff *et al.* 1995). This suggests that the Foothills fire area may be more susceptible to extensive, high-intensity fires in the future than if no salvage logging activities had been conducted following the fire.

In summary, AFSEEE finds that the Boise report, *Implementation and Effectiveness Monitoring of Best Management Practices and Soil and Water Protection Measures Within the Foothills Fire Salvage Logging Area, 1992-1995*, lacks scientific integrity. The report contains sweeping claims with little supporting data or analysis. We can't help but wonder why so little data and analysis are presented. According to the director of the Forest Service's Intermountain Research Station, at least some of the data are still in "raw form, not having been analyzed nor formally reported" (Burns 1995). Even where summarized data and cursory analyses are provided, they do not lead to the conclusions that the report offered. A scientifically sound report would have offered only those conclusions that could legitimately be drawn from the information provided.

AFSEEE suggests that the following conclusions would have been more appropriate, given the information available in the Boise report:

1. Whether watershed conditions actually improved as a result of salvage logging activities cannot be determined from this study. More information is needed, including monitoring several indicators of watershed condition over a longer period of time.

2. Field observations suggest that when slash from salvage logging was left as a way of increasing effective ground cover, AND when this was combined with certain watershed protective measures such as storm proofing of roads, sediment delivery to streams may have been less than in untreated areas. It is not clear to what extent the observed beneficial effect is attributable to the watershed protective measures, and to what extent it is attributable to the presence of logging slash.

3. Field observations indicate that problems with accelerated erosion, sediment delivery and instream sedimentation occurred when salvage logging was conducted without implementing watershed protective measures.

References

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